

# THE PELTATE PEPEROMIAS OF NORTH AMERICA<sup>1</sup>

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(WITH PLATES I-IV)

A herbaceous pepper from Santo Domingo, with large slightly peltate leaves, was called *Piper maculosum* by LINNAEUS in 1753, the year conventionally agreed upon as the starting point in phanerogamic nomenclature. This species was transferred to *Peperomia* by the elder HOOKER in 1825. When RUIZ and PAVON established the genus *Peperomia* in 1794, they included in it three Peruvian species with peltate leaves; one of these they named *P. umbilicata* and one *P. variegata*. In 1804 VAHL described, as *Piper hernandifolium*, a fifth species, from the West Indies, with such foliage. DIETRICH recognized this as a *Peperomia* in 1831. Another South American *Peperomia* was described in 1815 by HUMBOLDT, BONPLAND, and KUNTH, who also found in Mexico what they took for the *Peperomia umbilicata* of RUIZ and PAVON.

Following these determinations, most of the Mexican specimens with centrally peltate foliage have been called *P. umbilicata*; but MARTENS and GALEOTTI differentiated a close counterpart of *P. umbilicata* in 1843, as well as a diminutive species with barely peltate leaves. On the latter, before the Belgian botanists had secured printing of their account of GALEOTTI'S numerous discoveries in the Mexican flora, MIQUEL, who was engaged on a monographic study of the Piperaceae, based the name *Tildenia mexicana*, and transferred it to *Peperomia* under the same specific name in 1843 in his classic monograph of the Piperaceae, where their other peltate species appears as *P. monticola*, and which also added the Brazilian peltate species *P. arifolia* now so much cultivated in a silvery-striped variety. A Guatemalan species rather closely comparable in some respects with the original *P. umbilicata* was named *P. claytonioides* in 1847 by KUNTH, to whom are com-

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monly attributed the names used in the joint publication of HUMBOLDT, BONPLAND, and KUNTH.

As a result of studies preliminary to his own monograph of the Piperaceae, in 1866 DE CANDOLLE added two South American species to the *P. umbilicata* group, as well as one, *P. ovato-peltata*, questionably based on both Mexican and Costa Rican material and scarcely distinguishable today, and a caulescent subpeltate species, *P. cordulata*, from Panama. Shortly after the publication of DE CANDOLLE'S monograph in 1869, he gave publicity to a diminutive Mexican species, *P. fugax*, which LIEBMANN had discovered and named in manuscript, in addition to two scarcely differentiable larger peltate species, *P. Muelleri* and *P. Bourgeaui*, from eastern Mexico. Slightly antedating the publication of these, BAKER described another, *P. puberula*, very closely related to them, from Gautemalan plants cultivated in England.

It was not until 1887 that another addition was made to the *P. umbilicata* group, when WATSON distinguished in what he called *P. gracillima* a west Mexican counterpart of the original Peruvian species and its representatives in eastern Mexico and Guatemala. Four years later, DE CANDOLLE described *P. scutellata*, of Costa Rica, and in the course of the following decade further named an additional peltate species, *P. macrandra* from Mexico; and from Central America added five others, *P. peltata*, *P. sciaphila*, *P. Tuerckheimii*, *P. tecticola*, and *P. podocarpa*; and in 1902 *P. Bakerii* was described by him from Cuba.

At the end of the century all of the available material was gone over critically by DAHLSTEDT in an exhaustive revision; but an even more fruitful comparative study of the corm-producing group, centering about *P. umbilicata*, was made nearly a decade later by A. W. HILL, whose Andean field observations and seedling studies of the geophilous species led to a very satisfactory morphological distinction between North American and South American groups, centering respectively about *P. umbilicata*, and the Mexican forms that had been mistaken for or too closely connected with that Peruvian plant. In addition to describing several new peltate species from the southern continent, he differentiated under the name *P. campylotrapa* what appeared to be the most frequently

encountered northern surrogate of the true *P. umbilicata*, and added a new Guatemalan species, *P. bracteata*.

The purpose of the present paper is to outline succinctly the result of a preliminary study of the peltate-leaved species of *Peperomia* of North America, inclusive of the West Indies, based chiefly on the extensive collections of the United States National Herbarium and the New York Botanical Garden. For the privilege of examining these, I am greatly indebted to Mr. MAXON and Dr. BRITTON. No effort is made here to give full descriptions or citations; but the admitted species are keyed apart sufficiently for their present characterization, and reference is made to all publications affecting their nomenclature.

Although they agree in possessing more or less strikingly peltate foliage, the plants here accounted for constitute four natural groups of species, of which the first three are interrelated, while the fourth has little in common with the others except that it falls within the generic limits of *Peperomia* as these are now drawn. Each of the first two groups is subdivisible into minor groups on floral as well as vegetative characters. These distinctions are sufficiently evident from the synopsis without separate discussion. Except for the very distinct fourth group, *Hernandi-foliae*, all are continental.

#### SYNOPSIS OF GROUPS

Acaulescent; pistil not in a pit; stigma apical	
From a round or lens-shaped corm; glabrous.....	CAMPYLOTROPAE
Subrhizomatous; glabrous; diminutive.....	MEXICANAE
Subrhizomatous; glabrous; rather large.....	MACRANDRAE
Substoloniferous; pubescent; diminutive.....	TUERCKHEIMIAE
Shortly caulescent; pistil not in a pit; stigma subapical	
Small and delicate; somewhat pubescent.....	FUGACES
Moderately large.....	ARIFOLIAE
Repent; moderately large; pistil not in a pit; stigma apical..	CORDULATIFORMES
Repent; rather large; pistil in a pit, beaked; stigma at base of beak.....	HERNANDIFOLIAE

#### CAMPYLOTROPAE

Rather small, acaulescent from a smooth corm, glabrous; leaves peltate near the middle or well above the base; spikes usually very

slender and loosely flowered; bracts oblong-ovate, pointed; pistil not immersed in the rachis; stigma apical.

Leaves orbicular, rarely subacuminate; scapes unbranched

Filaments scarcely protruding beyond the bract; berries essentially sessile

Stigma sessile

Ovary blunt

Berries ellipsoid.....*P. monticola*

Berries globose.....*P. Painteri*

Ovary subacute.....*P. astyla*

Stigma on a more or less evident style

Style or stylopodium broadly conic.....*P. Parryana*

Style slender-conic.....*P. tenuimucronata*

Style rather abruptly cylindrical.....*P. campylotropa*

Filaments conspicuously exerted

Anther cells at length divergent.....*P. schizandra*

Anther cells not divergent

Berries flask-shaped, sessile.....*P. amphoricarpa*

Berries ovoid, substipitate.....*P. gracillima*

Leaves subrhombic-orbicular; scapes unbranched.....*P. bracteata*

Leaves orbicular-acuminate; scapes often branched;

berries sessile

Berries flask-shaped with tapering style.....*P. schizostachya*

Berries subglobose with abrupt style.....*P. claytonioides*

Leaves ovate

Scapes often branched; berries sessile

Scapes characteristically branched.....*P. sciaphila*

Many scapes unbranched.....*P. ovato-peltata*

Scapes unbranched; berries stipitate, with slender style.....*P. peltata*

**PEPEROMIA MONTICOLA** Miquel, Syst. Piper. 71. 1843.—*Piper* (§*Peperomia*) *hydrocotylifolium* Martens and Galeotti, Bull. Acad. Bruxelles 10:129. 1843.—? *Peperomia umbilicata macrophylla* C.DC. in DC. Prodr. 16<sup>t</sup>:394. 1869.—Acaulescent; glabrous throughout; leaves round, centrally peltate, 3.5–5.5 cm. in diameter; berries sessile, ellipsoid; stigma sessile at the apex.

Southern Cordillera of Mexico, the type from near Tehuacan, Puebl. (*Galeotti* 6023, which is also the type of *Piper hydrocotylifolium*).

As with *P. mexicana*, this was distinguished and described by its discoverer, but antedated in publication by another, as was true also of two of GALEOTTI'S Mexican oaks.

**Peperomia Painteri**, n. sp.—? *Peperomia umbilicata subacutifolia* C.DC. in DC. Prodr. 16<sup>t</sup>:394. 1869.—Aspect and general

characters of the preceding; leaves 1.5–2 cm. in diameter; berries globose; stigma sessile at the apex.—Fig. 5.

Table-land and adjacent Cordillera of Mexico, the type from Ixmiquilpan, Hidalgo (*Rose, Painter, and Rose* 8966).

**Peperomia astyla**, n. sp.—Aspect of the preceding; leaves 1.5–2.5 cm. in diameter, sometimes blunt-acuminate; ovary ovoid-flask-shaped, subacute; stigma apical.—Fig. 4.

Western Sierra Madre of Mexico, the type from Lake Patzcuaro, Michoacan (*Pringle* 4124).

**Peperomia Parryana**, n. sp.—Aspect of the preceding but the scapes sometimes 20 cm. long; ovary round-ovoid, tapering into a short broadly conic disk or style; stigma apical.—Fig. 7.

Eastern Sierra Madre and adjacent table-land of Mexico, the type from about San Luis Potosi, S.L.P. (*Parry and Palmer* 802).

With more filiform spikes and larger broadly conic style, it is var. **borealis**, n. var.

Type from La Silla, Monterrey, N.L. (*Pringle* 3018).

**Peperomia tenuimucronata**, n. sp.—Aspect of the preceding species; ovary flask-shaped, slenderly attenuate; stigma apical.—Fig. 12.

Western Sierra Madre of Mexico, and Cape region of Baja California, the type from near Santa Teresa, Tepic (*Rose* 3432).

PEPEROMIA CAMPYLOTROPA Hill, Ann. Botany 21:156. 1907.—Aspect of the preceding species and taken as typical of the group which they constitute; leaves 1.5–3.5 cm. in diameter; berries round-ovoid, with a short cylindrical style; stigma apical.—Fig. 10.

Mexican table-land and adjacent mountains; taken to be *P. umbilicata* HBK. (not RUIZ and PAVON), the type of which was from Santa Rosa de la Sierra (*Humboldt*).

**Peperomia schizandra**, n. sp.—Aspect of the preceding; leaves 4–5.5 cm. in diameter; stamens somewhat exserted, their anther cells at length widely spreading; berries ovoid, somewhat acuminate pointed; stigma apical.—Fig. 1.

Western Sierra Madre of Mexico, the type from Bolaños, Jal. (*Rose* 2883).

**Peperomia amphoricarpa**, n. sp.—Aspect of the preceding; stamens exerted; ovary oblong; berries ovoid-flask-shaped, gradually attenuate; stigma apical, for a time white-fimbriate.—Fig. 11.

Southern Cordillera of Mexico, the type from the Cerro San Felipe, Oax. (*Nelson* 1139). Presumably it was this which MARTENS and GALEOTTI took for *P. umbilicata*.

PEPEROMIA GRACILLIMA S. Wats.—*Peperomia gracillima* S. Wats., Proc. Amer. Acad. 22:448. 1887.—Aspect of the preceding; leaves 1.5–2 or even 4 cm. in diameter; filaments exerted beyond the bract; ovary ovoid, (?normally) stipitately contracted, with a stout style; stigma apical.—Fig. 6.

Western Sierra Madre of Mexico, the type from the Rio Blanco, near Guadalajara, Jalisco (*Palmer* 585).

PEPEROMIA BRACTEATA Hill, Ann. Botany 21:155. 1907.—Aspect of the preceding; leaves subrhombic-orbicular, slightly blunt-pointed, 2–3 cm. in diameter; berries subfusiform-globose, with a thick terminal disk or stylopodium; stigma apical.

Guatemala, the type from Sactos, Huehuetenango (*Seler* 2743).

**Peperomia schizostachya**, n. sp.—Aspect of the preceding; leaves subangularly ovate, more or less cuspidate or deltoid-pointed, 2 × 2.5–5 × 7 cm.; scapes simple or forked; berries flask-shaped, attenuate; stigma apical.—Fig. 2.

Costa Rica, the type from the Rio Virilla, near San Juan (*Tonduz* 10106 = 7273).

PEPEROMIA CLAYTONIODES Kunth, Index Sem. Hort. Berol. 1847:11.—Aspect of the preceding; leaves ovate or round-ovate, more or less acuminate, 2–4 cm. in diameter; spikes characteristically 2 or 3 at end of the branching scape; berries subglobose-cylindric, with an abrupt style; stigma apical.

Guatemala, the type cultivated from an unrecorded Guatemalan locality.

With scapes much longer than the leaves, and bearing 4–6 alternate branches near the end, it is var. **longiscapa** C.DC., MS. n. var.—Fig. 13.

Guatemala, the type (*Bernhardi*) from an unspecified locality.

With scapes scarcely surpassing the leaves, bearing 4-6 sub-apical spikes scarcely 3 cm. long, it is var. *pinulana* C.DC., MS. n. var. (*P. pinulana* C.DC., Bot. Jahrb. 10:289. 1889).

Guatemala, the type from Pinula, near Xalapa (*Lehmann* 1693).

PEPEROMIA SCIAPHILA C.DC., An. Inst. Fis.-Geogr. Costa Rica 9:175. (1898?).—?*Peperomia ovato-peltata* Auct., as to Costa Rica.—Acaulescent; leaves broadly ovate, blunt-acuminate, rounded at base, peltate below the middle; spikes scarcely 2 cm. long, 2-7 nearly sessile at end of a filiform scape surpassing the leaves; ovary ovoid, subacute; stigma apical.—Fig. 14.

Costa Rica, the type from the Rio Virilla near San Juan (*Tonduz* 9630).

PEPEROMIA OVATO-PELTATA C.DC., Jour. Botany 4:132. 1866.—Aspect of the preceding; leaves broadly ovate, acuminate, peltate one-third above the rounded or subcordate base; spikes solitary or 2 or 3 near the end of a filiform scape equaling or surpassing the leaves; ovary round-ovoid, contracted into an equilong fleshy style; stigma apical.

A problematic species, perhaps representing a depauperate form of the preceding and if so to replace it in name. Two specimens (New Spain, *Pavon*; Costa Rica, *Hoffmann* 521) are mentioned with the original description, but both are questioned there.

PEPEROMIA PELTATA C.DC., Ann. Conserv. and Jard. Bot. Genève. 2:277. 1898.—*P. pedicellata* Dahlst., Svensk. Vet.-Akad. Handl. 32<sup>2</sup>:35. 1900.—*P. ovato-peltata* Auct., as to Guatemala.—?*P. mexicana* Auct., as to Guatemala.—Acaulescent; leaves broadly ovate, subacuminate, truncately cordate, peltate toward the base, 2×3-3×4 or 5 cm.; scape unbranched; berries long and slender, tapering into an extremely slender stipe; stigma apical.—Fig. 15.

Guatemala, the type from Santa Rosa (*J. D. Smith* 3829, which is also the type collection of *P. pedicellata*).

#### MEXICANAE

Diminutive, subacaulescent from a small, finally branching rhizome; glabrous; leaves peltate at the very base; peduncles

unbranched; spikes filiform, loosely flowered; bracts ovate, pointed; pistil not immersed in the rachis; stigma apical.

Leaves ovate-oblong, style slender.....*P. mexicana*

PEPEROMIA MEXICANA (Miq.) Miquel, Syst. Piper. 75. 1843.—*Tildenia mexicana* Miquel, Diar. Inst. Reg. Nederl. 83. 1842.—*Piper* (§*Peperomia*) *parvulum* Martens and Galeotti, Bull. Acad. Roy. Bruxelles 10:130. 1843.—*Peperomia Galeottiana* Hooker, Icon. Plant. 4. pl. 327.—Essentially acaulescent, from a short rhizome, very small, glabrous throughout; leaves ovate and obtuse or characteristically lance-ovate or elliptic-ovate and attenuate, peltate extremely close to the base,  $8 \times 12$ – $10 \times 25$ – $30$  mm.; spikes solitary at end of filiform scapes twice as long as the petioles; berries oblong, pointed; stigma apical.—Fig. 3.

Eastern Sierra Madre of Mexico, the type from Mirador, Vera Cruz (*Galeotti* 7111, which is also the type of *Piper parvulum*).

#### MACRANDRAE

Moderately large, subacaulescent from a short branching rhizome, glabrous; leaves peltate below the middle; scapes unbranched; spikes loosely flowered; bracts ovate, pointed; pistil not immersed in the rachis, stigma apical.

Leaves elongated-ovate; berries oblong.....*P. macrandra*

PEPEROMIA MACRANDRA C.DC., Ann. Conserv. and Jard. Bot. Genève 2:276. 1898.—Essentially acaulescent, from a short thick polycephalous rhizome, glabrous throughout; leaves ovate, acuminate, peltate toward the base,  $2.5 \times 4$ – $4.5 \times 7$  cm.; spikes solitary at end of scapes rather surpassing the petioles; filaments exerted; berries ellipsoid-oblong, (teratologically?) gradually tapering into an equilong style; stigma apical.

Southern Cordillera, Mexico, the type from San Felipe, Oax. (*Pringle* 4654).

A large form, presumably from the same geographic region, with round-ovate leaves as much as  $8 \times 10$  cm. and shorter beak on the fruit, is var. **ampla**, n. var.

Type, without other data, occurring in the United States National Herbarium as *Pringle* 13282.—Fig. 8.



## TUERCKHEIMIEAE

Diminutive, subacaulescent from a short rhizome, sparsely villous; leaves peltate toward the base; peduncles unbranched; spikes filiform, loosely flowered; bracts round-ovate, scarcely pointed; pistil not immersed in the rachis; stigma apical.

Leaves ovate, small . . . . . *P. Tuerckheimii*

PEPEROMIA TUERCKHEIMII C.DC., Ann. Conserv. and Jard. Bot. Genève 2:279. 1898.—Nearly acaulescent, small, dingy-villous; leaves alternate, ovate, acute, peltate toward the base, 2 × 2.5 cm. with equilong petiole; spikes axillary, filiform, short (20–40 mm.); berries ovoid, subacute; stigma apical.—Fig. 9.

Guatemala, the type from Pansamala (*von Tuerckheim* 433).

## FUGACES

Diminutive, caulescent, slightly pubescent; leaves peltate toward the base; peduncles unbranched; spikes filiform; pistil not immersed in the rachis; stigma subapical.

Leaves ovate; spikes pubescent . . . . . *P. fugax*

PEPEROMIA FUGAX Liebmann, in C.DC., Linnaea 37:370. "1871-3."—Shortly caulescent (3 cm. high), locally hairy; leaves alternate, ovate, acute, peltate toward the base, ciliolate, scarcely 10 × 13 mm., on an even shorter hairy petiole; spikes axillary; ovary ovoid; stigma suboblique.

Eastern Sierra Madre, Mexico, the type from Mirador, Vera Cruz (*Liebmann*).

## ARIFOLIAE

Moderately large, with a usually evident thick erect stem from a rhizome; leaves peltate below the middle; peduncles unbranched; spikes moderately slender and closely flowered; bracts orbicular; pistil not immersed in the rachis; stigma subapical.

Glabrous . . . . . *P. arifolia*

Pubescent

Spikes rather thick

Stigma obliquely subsessile . . . . . *P. puberula*

Stigma on a short style . . . . . *P. Muelleri*

Spikes scarcely 1 mm. thick . . . . . *P. tecticola*

Spikes 1-2 mm. thick . . . . . *P. Killipi*

*PEPEROMIA ARIFOLIA* Miquel, Syst. Piper. 72. 1843.—Shortly caulescent, succulent, glabrous; leaves alternate, round-ovate, subacute or short-pointed, peltate toward the truncately subcordate base, 5–6 × 6–9 cm., the petiole nearly as long; spikes terminal, solitary, about 100 mm. long, on nearly equilong peduncles; berries ovoid; stigma essentially sessile at or very near the end.

A Brazilian species, the type cultivated in Europe; common everywhere in conservatories in the nearly acaulescent silver-striped var. *argyreia* (or *P. Saundersii*); reported, doubtless in cultivation, for Bermuda; and represented by a var. *acutifolia* C.DC., n. var., with acute smaller leaves 3.5 × 5.5 cm., on petioles 7.5 cm. long, cultivated in Switzerland from Costa Rican (?cultivated) material.

*PEPEROMIA PUBERULA* J. G. Baker, in Saunders, Ref. Bot. 5. pl. 302. 1871.—Shortly caulescent, rather succulent, somewhat velvety; leaves alternate, broadly ovate, subacute or abruptly short-pointed, peltate toward the rounded or subcordate base, 3 × 4–6 × 7 cm., the petiole of more or less equal length; spikes terminal and axillary, 50–100 mm. long, on somewhat shorter peduncles; berries obovoid, the subsessile stigma slightly oblique.—Fig. 17.

Guatemala, the type cultivated in England from Alta Vera Paz.

*PEPEROMIA MUELLERI* C.DC., Linnaea 37:366. "1871-3."—*Peperomia Bourgeauii* C.DC., Linnaea 37:370. "1871-3."—Shortly caulescent, rather succulent, gray-pilose; leaves alternate, broadly ovate, more or less acuminate, peltate toward the subcordate base, 4–6 × 6–7.5 cm., the petiole slightly shorter; spikes terminal and axillary, slender, equaling or surpassing the leaves, the peduncle shorter than the petiole; berries round-ovoid, obliquely short-mucronate, terminated by the stigma.

Eastern Sierra Madre, Mexico, the type from Orizaba, Vera Cruz (*Mueller* 653); that of *P. Bourgeauii* from the Rio Blanco near Orizaba (*Bourgeau* 3230).

*PEPEROMIA TECTICOLA* C.DC., An. Inst. Fis.-Geogr. Costa Rica 9:175. (1898?).—Shortly caulescent, rather succulent, loosely short-hairy; leaves alternate, ovate or elongate-ovate, somewhat acuminate, peltate toward the rounded or shallowly subcordate base, 2 × 4 cm., the petiole about equilong; spikes terminal or

axillary, solitary, 80–120 mm. long, densely flowered, on peduncles about as long as the petioles; bracts round-peltate; berries round-ellipsoid; stigma oblique.

Costa Rica, the type from San José (*Tonduz* 7262, in a roof gutter).

A form with larger leaves 3–3.5 × 6–7 cm. and spikes fully 150 mm. long, is var. **muricola**, n. var., Costa Rica, the type from San Juan (*Tonduz* 10146, on a wall).—Fig. 16.

**Peperomia Killipi**, n. sp.—Shortly caulescent, rather succulent, glabrate; leaves alternate, round-ovate, somewhat blunt-attenuate, barely subpeltate at the rounded or slightly cordate base, ciliolate, 3–3.5 cm. long and wide, the petiole about equilong; spikes terminal or axillary, solitary, 60 mm. long, densely flowered, on elongated peduncles; bracts round-peltate; berries round-ovoid; stigma oblique.

Panama, the type from Alhajuela, on the Chágres River (*Killip* 3218).

#### CORDULATIFORMES

Moderately large, repent or ascending, rooting from some nodes; leaves in part barely subpeltate at the very base, alternate; spikes solitary, terminal or opposite the leaves, closely flowered; bracts orbicular; pistils not immersed in the rachis; stigma apical.

Glabrous; berries sessile

Spikes rather thick.....*P. cordulata*

Spikes scarcely 1 mm. thick.....*P. cordulatifomis*

Somewhat hairy; berries stipitate.....*P. podocarpa*

**PEPEROMIA CORDULATA** C.DC., Jour. Botany 4:137. 1866.—Ascending, glabrous, slender; leaves alternate, round-ovate or ovate, subacute, obscurely subpeltate at the subcordate base, 5.5 × 7 cm., the petiole about 1 cm. long; spikes terminal, solitary, 150 mm. long; berries ovoid-acute; stigma oblique.

Panama, the type (*Fendler* 265) from an unrecorded locality.

**Peperomia cordulatifomis**, n. sp.—Ascending, glabrous, rather succulent; leaves alternate, round-ovate, bluntly short-acuminate, obscurely subpeltate at the cordate base, 3.5 × 5–5 × 6 cm., the petiole about 1 cm. long; spikes opposite the leaves, solitary,

filiform, scarcely 50 mm. long; berries round-ovoid; stigma oblique.—Fig. 19.

Panama, the type from Mamei Hill in the Canal Zone (*Pittier* 3806).

PEPEROMIA PODOCARPA C.DC., An. Inst. Fis.-Geogr. Costa Rica 9:175. (1898?).—Repent, more or less pilose, delicate, the stem scarcely over 1 mm. thick; leaves alternate, broadly ovate, cuspidate, peltate near the rounded base, 4×6 mm., the petiole shorter than the blade; spikes paired on short axillary or terminal stalks, very slender and short (0.5×15 mm.) and short-peduncled; berries oblong-ellipsoid, slender-stipitate, obtuse.

Costa Rica, the type from El General (*Pittier* 10595).

#### HERNANDIFOLIAE<sup>2</sup>

Rather large, repent and rooting from the nodes; leaves variously peltate, alternate; spikes solitary, or paired on a common stalk, closely flowered; bracts orbicular; pistils sessile, immersed in ovoid pits in the rachis, beaked, the stigma at base of the beak and exposed at the level of the rachis; the glutinous berries finally broken loose and extruded at right angles to the contracting rachis.

Usually puberulous, berries subovoid . . . . . *P. hernandifolia*

Leaves ciliate; berries cylindrical . . . . . *P. Bakerii*

Glabrous

Leaves round-ovate . . . . . *P. peltilimba*

Leaves lance-ovate, barely subpeltate . . . . . *P. scutellata*

PEPEROMIA HERNANDIFOLIA (Vahl) A. Dietr., Sp. 1:157. 1831.—*Piper hernandifolium* Vahl, Enum. 1:344. 1804.—*Peperomia Ponthieui* Miq., Syst. Piper. 186. 1843.—Repent, somewhat succulent, usually puberulous, the stem 2 mm. thick with elongated internodes; leaves alternate, broadly ovate, somewhat obliquely acuminate, rounded at base or subcordate, peltate below the middle, 4-5×6-8 or even 8×12 cm., the petiole 4-10 cm. long; spikes 1 or 2 at end of an axillary 1-bracted stalk 3-4 cm. long, 30-50 mm. long with an equilong peduncle; berries oblong-ovoid,

<sup>2</sup>The Antillean *P. distachya*, representative of a related group of species, sometimes has leaves barely subpeltate.

with a slender flexuous beak; stigma anterior at base of the beak.—Fig. 18.

Through the West Indies (to which the type is ascribed) and reaching Venezuela.

In the Eastern Sierra Madre of Mexico it is represented by an almost entirely glabrescent form, var. *calva*, n. var., the type of which is from Orizaba (*Botteri* 1158).

A Costa Rican form, glabrescent except that the rather large leaves are ciliate, is var. *ciliifera*, n. var., the type from Estrella, Cartago (*Cooper* 5917).

A glabrate Costa Rican form with filiform peduncle is var. *filipes*, n. var., the type from La Palma (*Tonduz* 12539).—Fig. 18, habit.

With even the upper face of the coriaceous, abruptly short-acuminate leaves puberulent, it is var. *cryptocarpa*, n. var., the type from near the Finca Sepacuite, Alta Verapaz, Guatemala (*Cook and Griggs* 533).

PEPEROMIA BAKERII C.DC. in Urban, *Symbolae Antillanae* 5:296. 1902.—Of the aspect of *P. hernandifolia* and scarcely separable, but with ciliate leaves and more cylindrical slender-beaked berries.

Cuba, the type from Lomas de Taro-Taro, Pinar del Rio (*Baker* 3833).

**Peperomia peltilimba** C.DC., n. sp.—Repent, glabrous, rather thick-stemmed; leaves alternate, round-ovate, sharply acuminate, peltate toward the rounded base, 3.5–5 × 4–5.5 cm., the petiole scarcely as long as the blade; spikes paired on bracted stalks, relatively thick and short (3 × 25 mm.); ovary ovoid, obliquely beaked, the stigma anterior on the beak.

Costa Rica, the type from San Ramon (*Brenes* 14178).

PEPEROMIA SCUTELLATA C.DC., Bull. Soc. Roy. Bot. Belg. 30:230. 1891.—Repent, glabrous, rather slender-stemmed; leaves alternate, lance-ovate, barely subpeltate at the very base, 3.5 × 7–8 cm., the petiole 4–8 cm. long; spikes paired on a short terminal stalk, shorter than the leaves; berries cylindrical, slender-beaked; stigma anterior on the beak.

Costa Rica, the type from near Division (*Pittier* 3611).

PEPEROMIA MACULOSA (L.) Hook., Exot. Fl. *pl.* 92. 1825.—*Piper maculosum* L., Sp. Pl. 30. 1753.—*Peperomia septuplinervia* C.DC., Jour. Botany 4:142. 1866.—*Peperomia monsterifolia* Grisebach, Cat. Pl. Cub. 64. 1866.—Ascending, sparingly hairy, succulent, the rather thick stem mottled; leaves alternate, elliptic-ovate, subcuspidate, peltate near the rounded or truncately subcordate base, 8–11 × 12–17 cm., the mottled petiole 6–15 cm. long; spikes solitary or paired at the end, large (6 × 250 mm.), caudately tapering; berries sessile, ovoid, tapering into an equilateral beak; stigma anterior on the beak.

Through the Antilles, the type from Haiti (*Plumier*).

PEPEROMIA VARIEGATA Ruiz and Pavon, Fl. Peru. 1:33. *pl.* 52. 1794.—Aspect of and not considered by MIQUEL separable from the preceding, but glabrous and with broader leaves 12–15 cm. long.

Peru to Demarara, and reported for Costa Rica and Guatemala possibly on forms of the preceding; the type from Peru.

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#### EXPLANATION OF PLATES I–IV

Habit illustrations are of natural size; inflorescence or fruit details are enlarged 20 diameters.

##### PLATE I

FIG. 1.—*Peperomia schizandra*, from type.

FIG. 2.—*Peperomia schizostachya*, from type.

FIG. 3.—*Peperomia mexicana*, from type number, also cotype of *Piper parvulum*.

FIG. 4.—*Peperomia astyla*, from type.

FIG. 5.—*Peperomia Painteri*, from type.

FIG. 6.—*Peperomia gracillima*, from cotype.

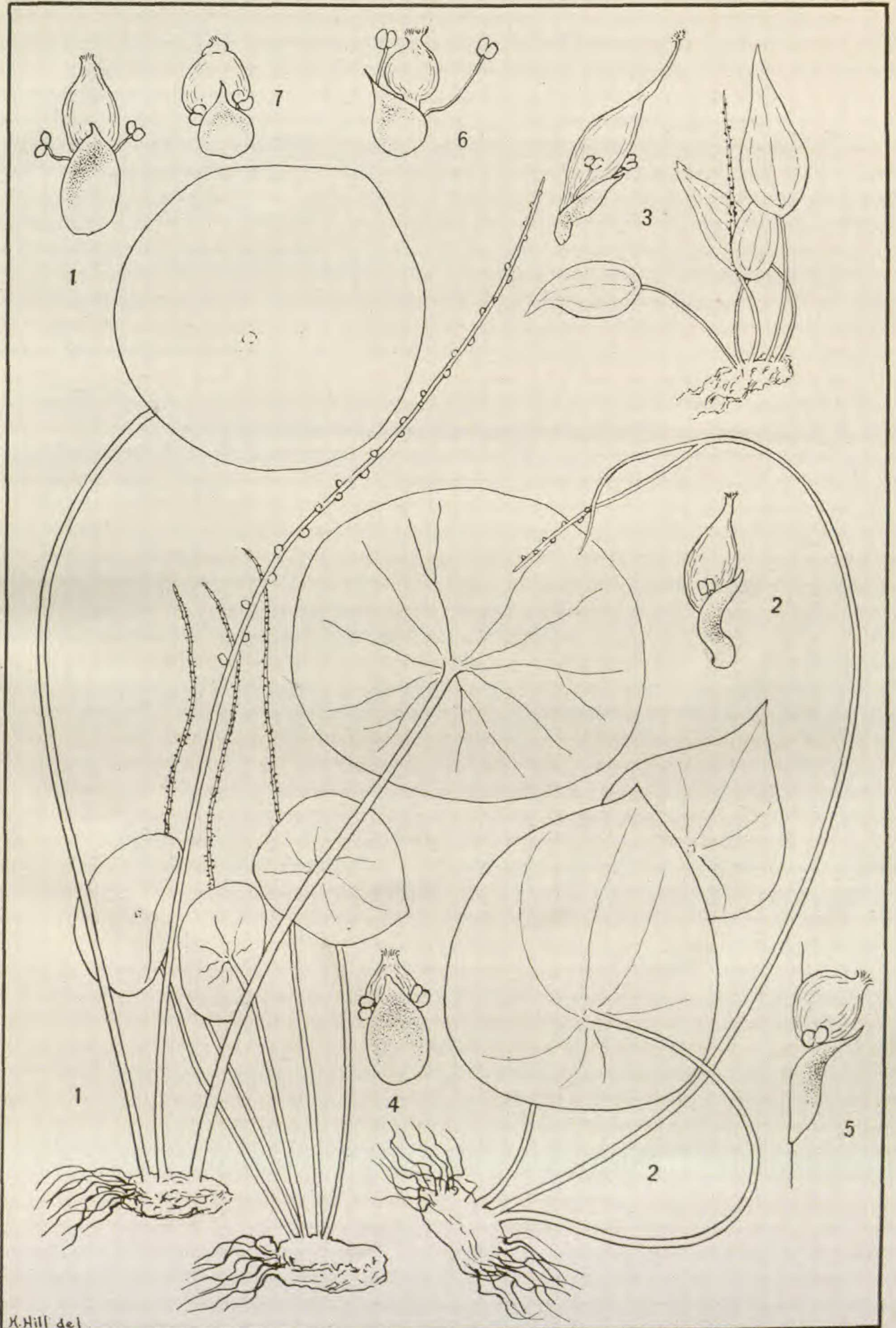
FIG. 7.—*Peperomia Parryana*, from type.

##### PLATE II

FIG. 8.—*Peperomia macrandra ampla*, from type.

FIG. 9.—*Peperomia Tuerckheimii*, from type collection.

FIG. 10.—*Peperomia campylotropa*, from sheet in United States National Herbarium (?erroneously) as *Bourgeau* 3020.



TRELEASE on PEPEROMIA